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ABSTRACT

A 6-year followup study was conducted for 36 low birth weight Spanish-American children (3 to 5 years old) who participated in a special intervention program. The program, designed around the Responsive Environment concept, provided educational stimulation. Utilizing teacher interviews, achievement measures, and trend analysis, the study found that, contrary to earlier predictions, former participants are surviving in a regular school setting. Descriptive analysis indicated that all but two students have followed regular grade placement and are judged by their teachers as average or slightly above average students. The trend analysis showed a slight drop in intelligence scores, English language scores, and Spanish language scores from the project exit point to the fifth grade. (SBH)

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THE LONG RANGE EFFECTS OF A "SPECIAL" INTERVENTION PROGRAM FOR LOW BIRTH WEIGHT CHILDREN: SOME FINDINGS AND METHODOLOGIES

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The basic assumption on which early intervention programs are based is that early stimulation for children who possess characteristics not associated with normal school achievement will increase their chances of achieving in a regular school setting. This assumption is based, for the most part, on the pioneering work of Hebb (1949) and subsequent studies indicating the positive effects of early stimulation. The work of Bloom (1965), however, provided the major impetus for the development of early intervention programs. Bloom concluded, after cross validating a large number of studies, that approximately 50 percent of all human characteristics are developed between conception and age four.

During the 1960's, attention also was being focused on the impact of poverty, culture, and language on school achievement (Brank and Marshall, 1966; Arnold and Taylor, 1969; and others). Given the general acceptance, although not without controversy, of Bloom's thesis and the information produced concerning the effects of poverty, culture, and language, it is understandable that early intervention programs would be

developed and implemented across the country.

THE PROGRAM

An early intervention program that was developed and implemented in 1970 was the Responsive Environment Program for Spanish-American Children (REPSAC) located in Clovis, New Mexico.* The program has been labeled "special" because of the unique population served and the nature of the program.

The target population for the program consisted of children possessing the following characteristics:

1. Ages ranging from three to five years.
2. Birth weight below five and one-half pounds. (Children with this characteristic were included in the project because of data of Birch (1964, 1969) and Cravioto (1969), indicating the premature/low-birth-weight child represents a high risk in terms of subsequent cognitive development.)
3. Handicapped in a variety of ways.
4. Home background including income level and education of parents.
5. Language base different from that used in school.

After the initial group of participants was selected, measures were taken on intellegence, language ability in

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English, language ability in Spanish, speech articulation, psychomotor ability, perceptual ability, and self-concept. Results of the analysis of pretest measures, along with the criteria used for selection, clearly described a group of children destined to school failure. If past practices were followed, the majority of these children would likely be placed in special education throughout their school experience.

The program developed and implemented for these children had as its general objective that of providing a special kind of early stimulation designed to assist these children, most likely to become functional mental retardates, in performing in a regular school program.

The program was developed around the "responsive enviroment" concept advocated by Moore (1963). The basic principles of this concept are that it:

1. Permits the learner to explore freely.
2. Informs the learner immediately about the consequences of his actions.
3. Is self pacing.
4. Emphasizes the discovery of relationships.
5. Structured so that the learner is likely to make a series of interconnected discoveries about the physical, cultural, or social world.

Specific program components were developed utilizing this concept. The program objectives stressed the cognitive,

psychomotor, and affective areas.

The short-range effects of the program were determined by systematic evaluation conducted by an independent evaluation team from a local university. The results of the evaluation indicated significant effects each year the project was evaluated, (Cornett, Ainsworth, and Askins, 1974). Short-range evaluation indicated the program was successful in bringing about the desired changes. Exit-level behavior was much more encouraging with regard to predicted performance in a regular school setting.

LONG-RANGE EFFECTS

Although short-range positive effects were noted consistently, the key to judging programs effectiveness has to be in terms of long-range effects. The basic question in this regard, noted by Bronfenbrenner (1975), is:

> Do children continue to improve, or at least to hold their own, after termination of the program, or do they regress to lower levels of function once the program is discontinued?

The purpose of this study was to determine the long-range effects of the REPSAC program on former participants' performance in school. More, specifically, the study attemped to answer the following questions:

1. What changes have occured in learning aptitude, language development in English, and language development in Spanish from the time of entry into

REPSAC to the end of the fourth year of regular school?

2. After entering regular school, what has been the status of former REPSAC students with regard to:
   a. grade placement?
   b. promotion/retention?
   c. special assistance?
3. How do teachers view former REPSAC students with regard to:
   a. academic performance?
   b. social adjustment?
   c. overall school performance?

Subjects

Subjects for the study were thirty-six children who entered the REPSAC program in 1971-72 and were enrolled in a regular school program at the end of the 1976-77 school year.

Methodology

In addition to the school performance data collected by questionnaires and interviews, the basic technique used in this study was secular trend analysis, a variation of time series analysis described by Daniel and Terrell (1975). It is a descriptive method suitable for determining the general behavior of a particular variable over a long period of time. The basis of the method is the establishment of a trend line

using the method of least squares. Actual data then are plotted and comparisons made between the predicted behavior of a variable and the actual behavior of that variable. Interpretation of the results is both descriptive and visual, but does not allow causal statements to be made. The method is, however, a useful tool in plotting the performance of students over a long period of time and comparing actual performance with what might be expected.

The variables and measures used in the trend analysis were as follows:

1. Learning Aptitude - Hiskey-Nebraska Test of Learning Aptitude
2. Language Development in English - Peabody Picture Vocabulary Test--English Version
3. Language Development in Spanish - Peabody Picture Vocabulary Test--Spanish Version

These measures were taken on the subjects on a pretest and posttest basis during the time they were participants in REPSAC and on a posttest basis each year they were in regular school. For each subject, then, seven measures for each variable were taken between the years 1971 to 1977.

FINDINGS

Table 1 presents the test results for each variable measured from 1971 to 1977. It can be noted from the table

that:

1. Learning aptitude scores (IQ) increased substantially after the first year of intervention and have remained relatively stable through 1977.
2. Language development scores in English gained substantially after the first year of intervention and again at the end of the second year of intervention. From the REPSAC exit point in the Spring of 1973, the scores exhibited a small but steady increase.
3. Language development scores in Spanish showed the largest increase at the end of the second year of intervention. A rather substantial decrease was noted from the REPSAC exit point in the Spring of 1973 to the Spring of 1976. However, Spring 1977 data showed an increase in Spanish language scores. This may be due, in part, to the establishment of a bilingual program in the schools that some of the students are attending.

TABLE 1

MEAN TEST SCORES OF FORMER REPSAC STUDENTS, 1971-1977

TEST	FALL 71	SPRING 72	FALL 72	SPRING 73	SPRING 75	SPRING 76	SPRING 77
HISKEY (IQ)	89.00	98.71	94.64	99.45	99.65	99.10	96.53
PEABODY (ENGLISH)	27.82	41.94	40.45	59.82	60.82	63.55	66.00
PEABODY (SPANISH	16.94	28.53	28.09	66.64	59.76	58.45	74.88

The results of the trend analysis are presented in Figures 1, 2, and 3. A comparison between the predicted growth pattern and the actual growth pattern can be made by viewing the relationship between the original data line and the trend line. The results of this analysis indicated that:

1. With regard to learning aptitude, the actual growth pattern of students departed markably from the predicted growth pattern, with the latter portion of the line indicating a slightly downward trend.
2. With regard to language development in English, the actual growth pattern compares favorably with the predicted growth pattern with the latter portion of the line moving in a slightly upward direction.
3. With regard to language development in Spanish, the actual growth pattern departed substantially from the predicted growth pattern in a downward trend. However, after the 1977 testing, an upward swing in performance appears to be starting.

FIGURE 1

LANGUAGE DEVELOPMENT SCORES IN SPANISH OF FORMER REPSAC STUDENTS, 1971-1977, ORIGINAL DATA AND TREND LINE

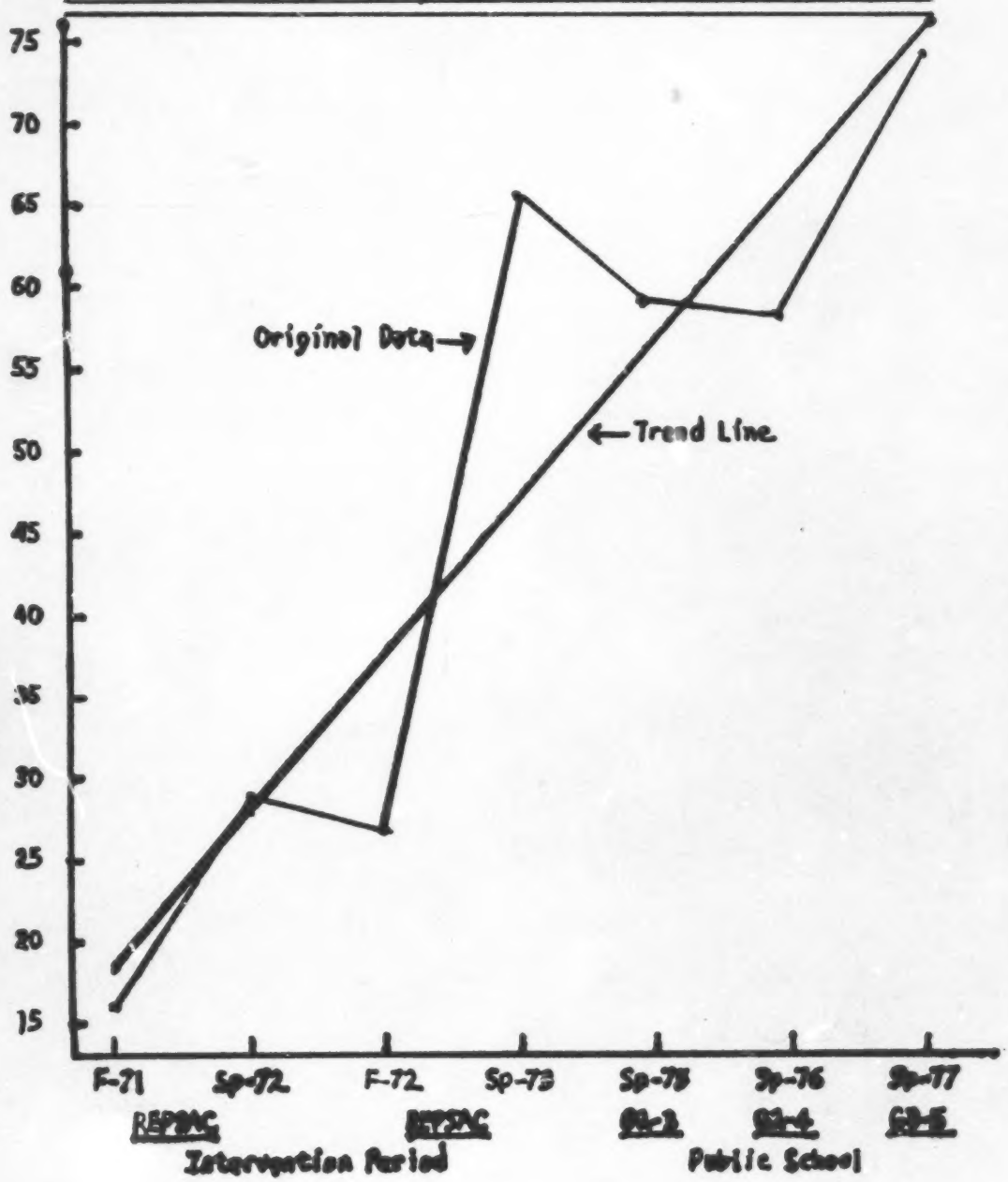

FIGURE 2

LANGUAGE DEVELOPMENT SCORES IN ENGLISH OF FORMER REPSAC STUDENTS, 1971-1977, ORIGINAL DATA AND TREND LINE

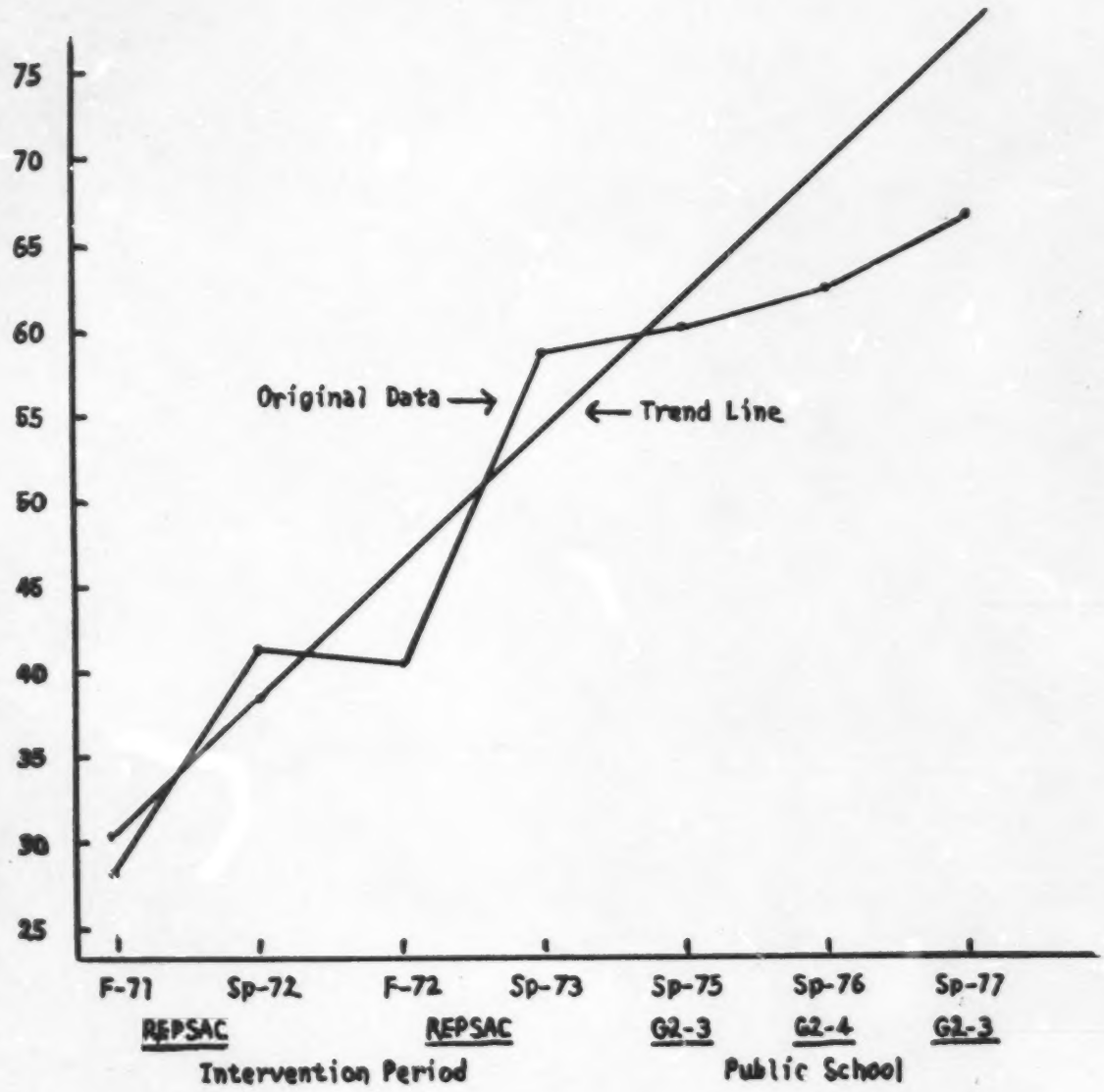

FIGURE 3

LEARNING APTITUDE SCORES OF FORMER REPSAC STUDENTS
1971-1977, ORIGINAL DATA AND TREND LINE

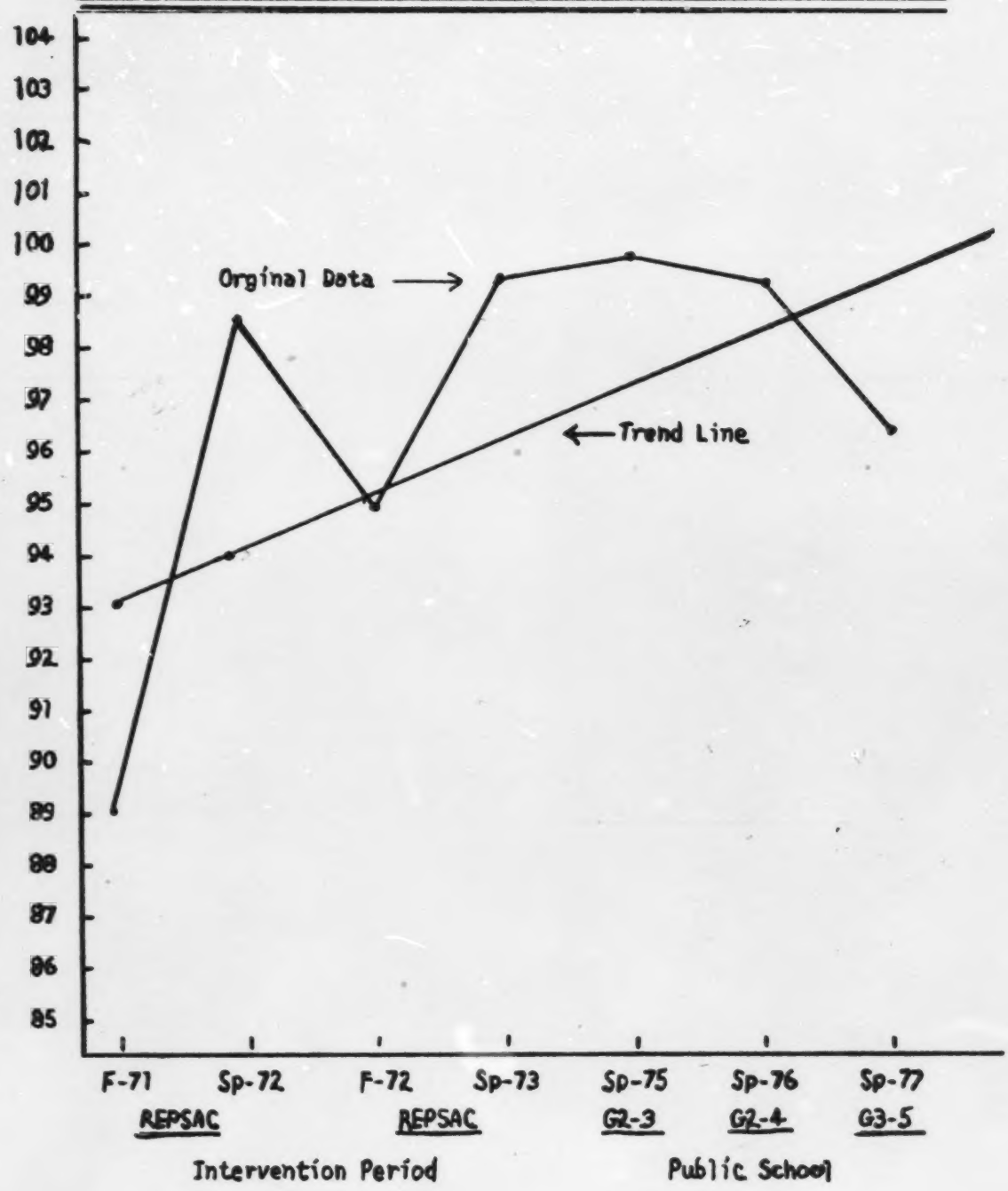

Table 2 presents data regarding the current status of former REPSAC students. As noted in the table, 24 of the former students are in regular classrooms and only two are currently in special education classes. None of the 24 students in regular classes has been retained and only two of the 24 students have required special assistance.

TABLE 2

CURRENT STATUS OF FORMER REPSAC STUDENTS

STATUS	TYPE	NUMBER	PERCENTAGE
GRADE PLACEMENT	REGULAR	24	92
	SPECIAL	2	8
PROMOTION/RETENTION	PROMOTED	24	100
	RETAINED	0	0
SPECIAL ASSISTANCE	YES	2	8
	NO	22	92

Tables 3, 4, and 5 present the results of teachers' views regarding academic performance, social adjustment, and overall school performance of former REPSAC students. As noted in these tables, the majority of former REPSAC students were rated in the middle one-third or above on academic performance and social adjustment and above average on overall school performance.

TABLE 3

TEACHER RATINGS OF FORMER REPSAC

STUDENTS ON ACADEMIC PERFORMANCE

RATING CATEGORY	NUMBER	PERCENTAGE
UPPER THIRD	6	25
MIDDLE THIRD	13	54
LOWER THIRD	5	21

TABLE 4

TEACHER RATINGS OF FORMER REPSAC STUDENTS

ON SOCIAL ADJUSTMENTS

RATING CATEGORY	NUMBER	PERCENTAGE
UPPER THIRD	10	42
MIDDLE THIRD	10	42
LOWER THIRD	4	16

TABLE 5

TEACHER RATINGS OF FORMER REPSAC STUDENTS

ON OVERALL SCHOOL PERFORMANCE*

RATING CATEGORY	NUMBER	PERCENTAGE
GOOD	8	33
AVERAGE	12	50
POOR	4	17

* Teachers were asked to rate each student in terms of overall performance, i.e., motivation, willingness to learn, attention, and academic progress.

CONCLUSIONS

From the data obtained and analyzed for this study, the following conclusions appear warranted.

1. In general, former REPSAC students are performing well in the regular school program. The majority of students have followed regular grade placement, have been promoted on schedule, have required little special help, were rated by their teachers in the middle one-third of their class on academic performance, were rated by their teachers in the middle or upper one-third of their class on social adjustment, and were rated as average on overall school performance.
2. Based on the test information and analysis, a trend toward a substantial decline in Spanish appears to have changed toward the positive, a trend toward less-than-normal growth in English language ability seems apparent, and a definite leveling of measured aptitude seems evident.

It should be noted that the performance of these students during the period 1971-1977 can be interpreted more accurately by considering their situation at the time of entry into REPSAC. The mean IQ of this group was 89 with English and Spanish scores of 27.82 and 16.94 respectively. This low level of performance, even when age is taken into account, along with other personal and social characteristics placed these children

in a "high risk" category with respect to school survival. Considering these conditions, the achievement of these children in 1977 is quite remarkable.

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